

CLAIMS:

1. A method of routing telephone calls from a subscriber telephone (10) in a telecommunications system comprising the Public Switched Telephone Network (16) and a public data network, for example the Internet, to a called party (18), the system including a local central office (14), a data network entrance node (26), a data network exit point (30), a subscriber interface unit (12; 12A) located at the subscriber premises and connected between the subscriber telephone (10) and the local central office (14), a called party interface unit (32; 12A'; 18C) connected to the data network exit point (30), a call server (38) provisioned with data and software for routing of data calls between the data network entrance node (26) and the data network exit point (30), the call server data including destination numbers and corresponding network addresses of called party interface units (32; 12A'; 18C) that are capable of converting signals between PSTN and data formats, and a management server (40) having software and data including rules for identifying classes of calls of a particular subscriber which should be routed via the data network, the subscriber interface unit (12) having means for accessing said rules, the method characterized by the steps of:
- at the subscriber interface unit (12; 12A),
- (i) detecting digits dialled by the subscriber to set up a call to said called party, said digits comprising at least the destination number of the called party;
 - 20 (ii) comparing at least some of the dialled digits with said rules to determine whether or not, according to said rules, the call is included within a specified class of calls to be routed via the data network,
 - (iii) if it is determined in step (ii) that the call not within the specified class, routing the call to a local central office for processing as a conventional PSTN telephone call;
 - 25 (iv) if it is determined in step (ii) that the call is within a specified class and should be routed through the data network, connecting to the call server (38) and supplying to the call server subscriber interface unit identification and the called party destination number;
- at the call server (38),
- 30 (v) using the called party destination number, identifying a corresponding data network address for the called party interface unit (32; 12A'; 18C), and setting up a

data connection between the subscriber interface unit and the called party interface unit via the public data network according to the protocol of the public data network, at each of the subscriber interface unit (12;12A) and called party interface unit,

- 5 (vi) on receipt of information that the connection has been established, converting subsequent signals from the subscriber and called party, respectively, from the PSTN format to a format compatible with the data network, and vice versa, as appropriate, until the call is terminated.

2. A method according to claim 1, characterized in that the subscriber interface unit
10 (12;12A) includes processor memory means for storing said rules and, during an initialization process obtains said rules from the management server (40), the management server rules being updated periodically by the service provider on a per subscriber basis.

3. A method according to claim 1 or 2, characterized in that the subscriber interface unit
15 (12;12A) contacts the management server periodically to obtain updated rules.

4. A method according to claim 1, 2 or 3, characterized in that the subscriber interface unit maintains PSTN and VOIP calls simultaneously and allows the subscriber to select one or the other without terminating either.

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5. A method according to any of claims 1 to 4, characterized in that the subscriber interface unit is connected to the entrance node (26) via a narrowband connection, and the connection to the entrance node is initiated while the dialled digits are being collected and the routing decision made.

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6. A method according to any of claims 1 to 5, characterized in that the subscriber interface unit is connected to the entrance node via a narrowband connection and, when a particular call has ended, the subscriber interface unit maintains the connection to the entrance node for a predetermined time while monitoring for a second call being initiated by the
30 subscriber.

7. A method according to any of claims 1 to 6, characterized in that the subscriber telephone set (10) supplies analog signals and the subscriber interface unit (12) performs analog-to-digital and digital-to-analog conversion of signals before or after the conversion, and vice versa.

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8. A method according to any of claims 1 to 7, characterized in that the called party equipment supplies analog signals and the called party interface unit (32;12A';18C) provides D-to-A and A-to-D conversion.

10 9. A method according to any one of claims 1 to 8, characterized in that the comparison step compares only a predetermined number of the most significant digits of the destination number in the dialled digits with said rules.

10. A telecommunications system comprising the Public Switched Telephone Network and
15 a public data network, for example the Internet, and means for routing calls between a subscriber telephone set (10) and a called party (18;18B), the system characterized by a local central office (14), a data network entrance node (26), a data network exit point (30), a subscriber interface unit (12; 12A) located at the subscriber premises and connected between the subscriber telephone (10) and the local central office (14), a called party interface unit (32;
20 12A';18C) connected to the data network exit point (30), a call server (38) provisioned with data and software for routing of data calls between the data network entrance node (26) and the data network exit point (30), the call server data including destination numbers and corresponding network addresses of called party interface units (32; 12A';18C) that are capable of converting signals between PSTN and data formats, and a management server (40)
25 having software and data including rules for identifying classes of calls of a particular subscriber which should be routed via the data network, the subscriber interface unit (12) having means for accessing said rules, wherein:
the subscriber interface unit (12;12A) comprises,

means (46;48) for

30 (i) detecting digits dialled by the subscriber to set up a call to said called party said digits comprising at least the destination number of the called party and

comparing at least some of the dialled digits with said rules to determine whether or not, according to said rules, the call is included within a specified class of calls to be routed via the data network;

5 (i)(a) if it is determined that the call is not within a specified class, routing the call to a local central office for processing as a conventional PSTN telephone call;

(i)(b) if it is determined that the call is within a specified class and should be routed through the data network, connecting to the call server (38) and supplying subscriber interface unit identification and called party information to the call server; the call server (38) comprising means for identifying from the called party destination number
10 the network address for the called party interface unit (32;12A;18C) and setting up a connection thereto;

the subscriber interface unit (12;12A) and called party interface unit each further comprising means for converting subsequent signals from the subscriber and called party, respectively, from the PSTN format to a format compatible with the data network and routing the resulting
15 data signals via the entrance and exit network nodes, and vice versa.

11. A system according to claim 10, characterized in that the subscriber interface unit (12;12A) includes processor memory means for storing said rules and, during an initialization process, obtaining said rules from the management server (40), the management server having
20 means for updated its rules periodically on a per subscriber basis.

12. A system according to claim 10 or 11, characterized in that the subscriber interface unit (12;12A) is adapted to contact the management server periodically to obtain updated rules.
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13. A system according to claim 10, 11 or 12, characterized in that the subscriber interface unit is adapted to maintain PSTN and VOIP calls simultaneously and allow the subscriber to select one or the other without terminating either.

30 14. A system according to any of claims 10 to 13, characterized in that the subscriber interface unit is connected to the entrance node (26) via a narrowband connection, and is

adapted to initiate the connection to the entrance node while the dialled digits are being collected and the routing decision made.

15. A system according to any of claims 10 to 14, characterized in that the subscriber interface unit is connected to the entrance node via a narrowband connection and, when a particular call has ended, maintains the connection to the entrance node for a predetermined time while monitoring for a second call being initiated by the subscriber.

16. A system according to any of claims 10 to 15, characterized in that the subscriber telephone set (10) supplies analog signals and the subscriber interface unit (12) performs analog-to-digital and digital-to-analog conversion of signals before or after the conversion, and vice versa.

17. A system according to any of claims 10 to 16, characterized in that the called party equipment supplies analog signals and the called party interface unit (32; 12A'; 18C) provides D-to-A and A-to-D conversion.

18. A system according to any of claims 10 to 17, characterized in that the subscriber interface unit has a mechanical switch connected between a first port and a second port for connection to the subscriber telephone set and the subscriber line, respectively, the switch being biased to connect the first and second ports directly in the event of power failure to the subscriber interface unit.

19. A system according to any one of claims 10 to 18, characterized in that the subscriber interface unit compares only a predetermined number of the most significant digits of the destination number in the dialled digits with the rules.

20. A subscriber interface unit for routing telephone calls via a PSTN or a public data network according to the method of claim 1, the subscriber interface unit (12; 12A) having a first port (42) for connection to a subscriber telephone set (10), a second port (52) for connection to a subscriber line, means (46, 48) for detecting dialled digits received via the first

port and using at least some of the dialled digits to access stored data including ranges of destination numbers, each comprising at least one destination number, and routing rules for different kinds of calls to determine whether the call should be routed via the PSTN or via a data network and, in the former case, connecting the first port (42) directly to the second port 5 (52) and, in the latter case, converting subscriber signals to data signals having a format suitable for routing through the data network and for converting data signals received from the data network into signals having a format compatible with the subscriber telephone set, the data signals being routed to and from the second port via modem means (50).

10 21. A subscriber interface unit according to claim 20, for use where the subscriber has a data connection to a network entrance node, characterized in that the subscriber interface unit has a further port (62) for connection to a broadband modem (63), and means (64,65) for communicating set-up data signals to and from the PSTN port (52), the data signals being routed to and from the further port (62).

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22. A process for providing dial tone to a standard telephony device, collecting therefrom dialled digits representing a telephone number of a called party and comparing at least some of the dialled digits with stored data comprising at least one range of destination numbers, said range comprising at least one destination number, to determine whether or not to route the 20 call over a public data network; connecting through the PSTN to a data network connection point (ISP), converting signals from the standard telephony device from analog to digital, placing the resulting digital signals into packets acceptable by the data network, routing the call via the data network to a data connection exit point convenient for a called party standard telephony device, receiving return digital signals from the called party standard telephony 25 device via the data network, converting the return digital signals to analog and conveying the resulting analog return signals to the subscriber telephony device.

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